

CLAIMS

1. A bottom sheet inserter, comprising:

a frame;

a first conveyor flight on the frame defining a path for a load and operable to move the load in a forward direction along the path to a bottom sheet insertion station; and

a second conveyor flight on the frame along the path and downstream of the bottom sheet insertion station and operable to move the load in said forward direction from the bottom sheet insertion station;

a bottom sheet feeder adjacent the bottom sheet insertion station operable to feed a bottom sheet from the bottom sheet insertion station onto the second conveyor flight and under a load moving onto the second conveyor flight.

2. A bottom sheet inserter as defined by claim 1, wherein:

the conveyor flights are comprised of rollers and the bottom sheet insertion station is defined between selected rollers of the first and second conveyor flights.

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3. A bottom sheet inserter as defined by claim 1, wherein:

the bottom sheet feeder includes a feed drive positioned to move a bottom sheet in the forward direction through the bottom sheet insertion station.

4. A bottom sheet inserter as defined by claim 1, wherein:

the first and second conveyor flights are comprised of rollers, and the bottom sheet insertion station is defined between selected rollers of the first and second conveyor flights; and

wherein the bottom sheet feeder is positioned below the first conveyor flight and includes a feed drive operable to move a bottom sheet in the forward direction through the sheet insertion station.

5. A bottom sheet inserter as defined by claim 1, wherein:

the bottom sheet feeder is positioned below one of the first and second conveyor flights and includes a feed drive and sheet lift positioned to move a bottom sheet upwardly and in the forward direction through the sheet insertion station.

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6. A bottom sheet inserter as defined by claim 1, wherein:

the bottom sheet feeder includes a feed drive comprised of a set of driven rollers mounted on the frame, and a sheet lift positioned to move a bottom sheet against the driven rollers, whereby the engaged bottom sheet is moved in the forward direction through the sheet insertion station.

7. A bottom sheet inserter as defined by claim 1, further comprising a leading edge deflector positioned between the bottom sheet feeder and bottom sheet insertion station.

8. A bottom sheet inserter as defined by claim 1, wherein:

the bottom sheet feeder is positioned upstream of the bottom sheet insertion station and further comprises a leading edge deflector positioned between the bottom sheet feeder and bottom sheet insertion station.

9. A bottom sheet inserter as defined by claim 1, further comprising:

a bottom sheet hopper adjacent the frame; and

a bottom sheet transport positioned adjacent the bottom sheet hopper.

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10. A bottom sheet inserter as defined by claim 1, further comprising:

a pair of bottom sheet hoppers adjacent the frame; and

a bottom sheet transport positioned between the pair of bottom sheet hoppers and adjacent the frame.

11. A bottom sheet inserter as defined by claim 1, further comprising:

wherein the first and second conveyor flights are comprised of rollers and wherein the bottom sheet insertion station is defined between a roller on the first conveyor flight and an adjacent roller on the second conveyor flight; and

wherein the bottom sheet feeder includes the roller on the second conveyor flight.

12. A process for inserting a bottom sheet below a load, comprising:

moving the load on a first conveyor flight along a path in a forward direction to a bottom sheet insertion station;

moving the load past the bottom sheet insertion station and onto a second conveyor flight downstream of the first conveyor flight;

progressively moving a bottom sheet under the load from the bottom sheet insertion station as the load moves onto the second conveyor flight such that the load becomes supported on the sheet and the bottom sheet becomes supported on the second conveyor flight.

13. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

operating a sheet feeder to move the bottom sheet under the load.

14. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

pressing the bottom sheet against a feed conveyor; and

operating the feed conveyor to move the bottom sheet through the bottom sheet insertion station and under the load as the load moves forwardly.

15. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

operating a sheet feeder to move the bottom sheet forwardly toward the second conveyor flight and through the bottom sheet insertion station from a bottom sheet receiving station below the first conveyor flight.

16. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

operating a sheet feeder to move the bottom sheet forwardly against a leading edge deflector; and

deflecting the sheet against the leading edge deflector and through the bottom sheet insertion station to position the bottom sheet in the path of a load on the first conveyor flight.

17. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

moving the bottom sheet from at least one of two hoppers, to a sheet feeder positioned under at least one of the conveyor flights; and

operating the sheet feeder to move the sheet forwardly through the sheet insertion station to position the bottom sheet under the load.

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18. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

moving the bottom sheet from a hopper to a sheet feeder positioned under the first conveyor flight; and

operating the sheet feeder to move the sheet forwardly and upwardly through the sheet insertion station to position the bottom sheet under the load moving forwardly on the conveyor.

19. A process for inserting a bottom sheet below a load as defined by claim 12, further comprising:

moving the bottom sheet from a hopper situated to one side of the conveyor flights to a sheet feeder positioned under the first conveyor flight; and

operating the sheet feeder to move the sheet forwardly and upwardly through the sheet insertion station to position the bottom sheet in the path of the load moving forwardly on the first conveyor flight.

20. A process for inserting a bottom sheet below a load as defined by claim 12, wherein progressively moving the bottom sheet includes:

manually moving the bottom sheet to a sheet receiver positioned under the first conveyor flight; and

positioning a leading edge of the bottom sheet in the path.

21. A bottom sheet inserter, comprising:

a frame;

a conveyor on the frame including first and second conveyor flights defining a path for a load and operable to move the load in a forward direction along the path and substantially in a plane;

a bottom sheet insertion station along the conveyor between the first and second conveyor flights;

a bottom sheet receiver adjacent the bottom sheet insertion station, configured to receive and orient a bottom sheet through the bottom sheet insertion station in the path of a load on the conveyor with a leading edge of the bottom sheet projecting above the plain and a trailing edge situated below the plane; and

a bottom sheet feeder adjacent the receiver and operable to feed the bottom sheet onto the second conveyor flight and beneath the load.

22. A bottom sheet inserter as defined by claim 21, wherein:

the conveyor is a belt conveyor; and

the first and second flights are formed by a common belt.

23. A bottom sheet inserter as defined by claim 21, wherein:

the conveyor includes a conveyor drive and wherein the conveyor drive also drives the bottom sheet feeder to move a bottom sheet in the forward direction through the sheet insertion station.

24. A bottom sheet inserter as defined by claim 21, wherein:

the conveyor is an endless belt conveyor with the first and second flights formed along the plane and wherein the flights are separated along said plane to form a bottom sheet receiving gap between a pair of intermediate rollers on opposite sides of the bottom sheet insertion station and defining ends of an intermediate flight that forms a partial loop about the bottom sheet receiver between the intermediate rollers and to one side of the plane.

25. A bottom sheet inserter as defined by claim 21, wherein:

the bottom sheet feeder is positioned downstream with respect to the forward direction from the bottom sheet insertion station.

26. A bottom sheet inserter as defined by claim 21, wherein the conveyor includes a conveyor belt movable in said forward direction along said plane and wherein the bottom sheet feeder is comprised of a conveyor roller engaging the conveyor belt and rotatably positioned downstream of the insertion station to engage and move the bottom sheet under a load moving along the conveyor.

27. A bottom sheet inserter as defined by claim 21, wherein the bottom sheet receiver includes a tray positioned below the first conveyor flight.

28. A process for inserting a bottom sheet below a load, comprising:

moving the load on a first flight of a conveyor along a plane in a forward path of travel;

placing a bottom sheet at a bottom sheet insertion station under the first flight and with a leading edge of the bottom sheet projecting above the plane and in the forward path;

engaging the bottom sheet by the load and moving the bottom sheet against a second conveyor flight that extends forwardly of the first flight from the bottom sheet insertion station; and

progressively moving the bottom sheet under the load and onto the second flight as the load moves along the forward path of travel such that the load becomes supported on the bottom sheet and second flight.

29. A process for inserting a bottom sheet below a load as defined by claim 28, including:

operating a sheet feeder to move the bottom sheet under the load from below the first flight as the load moves forwardly past the bottom sheet insertion station.

30. A process for inserting a bottom sheet below a load as defined by claim 28, including:

stopping forward progress of a load on the first flight; and

positioning the bottom sheet at the bottom sheet insertion station forward of the stopped load.

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